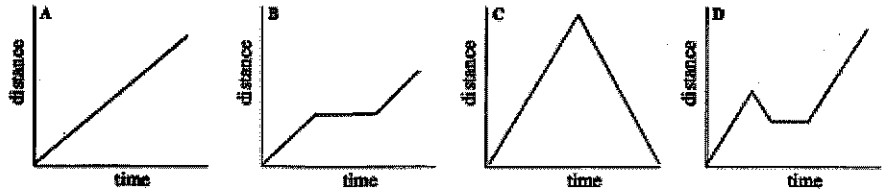
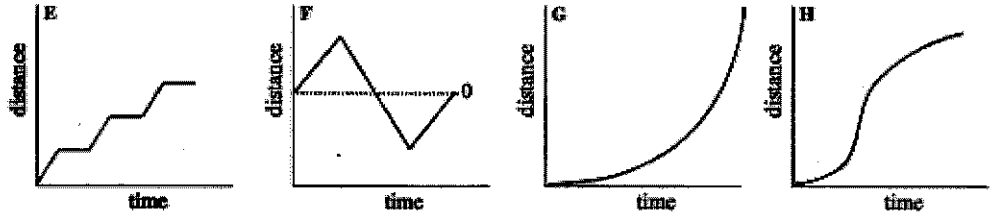
Study Guide For Motion Test 2019

Name _____ Key

Refer to your notes as a resource for motion graphs.



1. Which graph above shows a constant speed the entire trip without returning home? A
2. Which graph above shows a constant speed in one direction followed by a constant speed back to where they started? C
3. Which graph above shows a constant speed, then a stop, then another constant speed? B
4. Which graph above shows a constant speed, then immediately turn around and return toward the beginning, followed by a stop and then a constant speed in the opposite direction? D



5. Which graph above shows a person driving in one direction, turning around and driving back past where they started, then turning around again and driving in the original direction? ~~G~~ F
6. Which graph above shows three stops along the way? E
7. Which graph above shows acceleration? G
8. Which graph above shows acceleration and deceleration? H
9. Negative acceleration is another name for acceleration or deceleration? deceleration

Ch. 17. P. 458-459

1. When an object changes position over time relative to a reference point, the object is in motion
2. The object that appears to stay in one place is a reference point.
3. The most common reference point for determining motion is the Earth's surface.
4. If you were driving down the road, which would be the best reference point to use to prove that you are in motion? (the seat, the person beside you, a tree outside, a cloud) circle one.
5. What is the formula for speed? $S = \frac{d}{t}$

Ch. 17 p. 460-461

1. Velocity is speed of an object in a particular direction.
2. What are two ways velocity can change? direction and speed
3. What do you get if you combine the velocities of two objects? resultant velocity
3. If I am traveling on a bus that is going 10m/s East and I am walking 5m/s West on it, what is the resultant velocity? 5m/s E
4. If I am walking down an escalator at 3m/s down, and the escalator is going down at 1m/s, what is the resultant velocity? 4m/s down
5. If I am on a treadmill running 2m/s West, and the treadmill is going 2m/s East, what is the resultant velocity? 0m/s

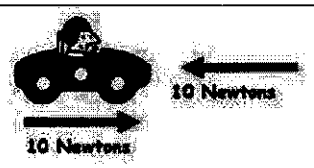
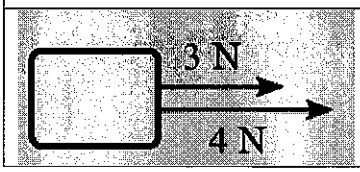
Ch. 17 p. 470-475 Friction as a Force

1. Friction is a force that opposes motion.
2. The amount of friction depends on these two things Force and roughness.
3. The two types of friction are Static and Kinetic.
4. Kinetic means moving.
5. Static means still.
6. To make an object move, you must convert static friction to Kinetic friction.
7. List an eample of helpful friction tread on tires.
8. List an example of harmful friction Parts on car engine rubbing.
9. List a way to increase friction rough up surface.
10. List a way to decrease friction add a lubricant or wheels.

Ch. 17 p. 464-469.Fill in the Blank Below.

1. A Force is a push or a pull.
2. Force is expressed in a unit call a Newtons.
3. The Net force is the combination of all forces acting on an object.

4. What is the net force on the plane? ____

Situation	Net Force
	2N →
	0N
	7N →

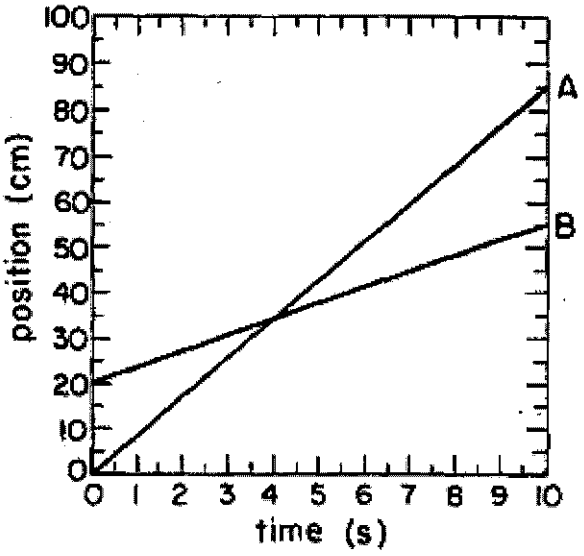
5. When the forces are balanced, the net force is always 0 N.
6. When the net force is any number other than 0N, then the forces are unbalanced
7. Can a balanced force ever make an object move? no
8. Can an unbalanced force ever make an object move? yes

Ch. 18 Newton's Laws of Motion (p. 502-508)

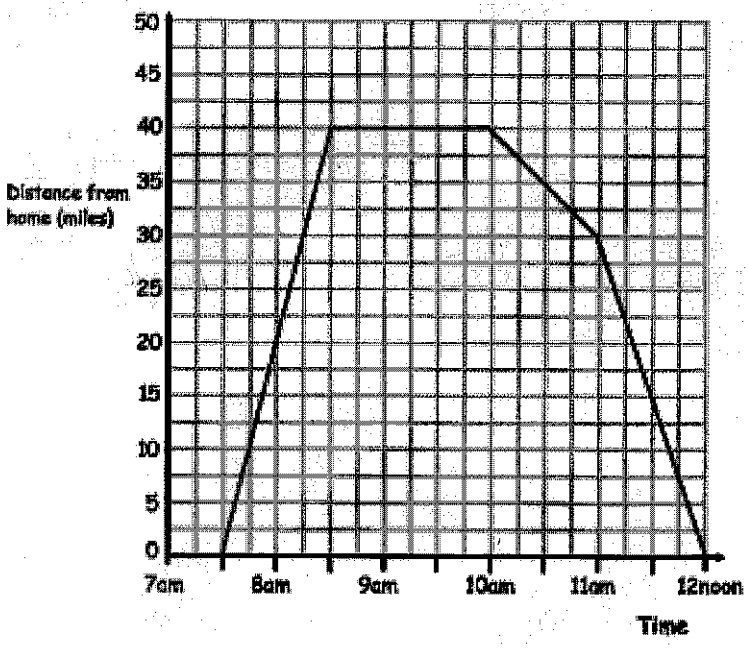
1. Newton's 1st Law of Motion states that an object at rest will remain at rest and an object in motion will remain in motion at a constant speed and a straight line unless acted upon by an unbalanced outside force.
2. Inertia is the tendency of all objects to resist any change in motion.
3. Bill Nye taught us that inertia is a property of matter.
4. An object will more mass will have more inertia than an object with less mass.
5. Newton's 2nd Law of Motion states that the acceleration of an object depends on the mass of the object and the force being applied.
6. The formula used to express Newton's 2nd Law is F=ma
7. If a 20kg puppy is running at 2.5 m/s2, then it will hit the sprinkler with 50 N of force.
8. If a 20 kg baby is pulling on a toy at .2 m/s2, how much force is on the toy? 4 N

9. Newton's 3rd Law of Motion states that for every action there is an equal and opposite reaction. It is equal in force, but opposite in direction.
10. Do forces work alone or in pairs? in pairs
11. List 3 forces we have on Earth that keep objects from moving at a constant speed in a straight line.
friction, gravity, air resistance
12. Which object will have more inertia, a student or a car? car Why?
Because a car has more mass

Use the graph below for the following questions:



1. Which object shows acceleration? Neither
2. What was the average speed of A? 8.5 cm/s
3. What was the average speed of B? 5.5 cm/s
4. Did A and B start at the same location? NO
5. If this was a race, who cheated in the very beginning? B
6. At what time did A pass B? About 4 sec.

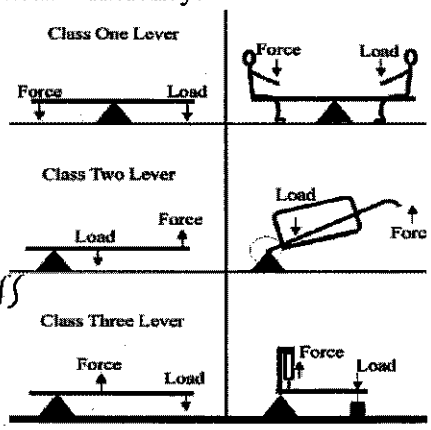


1. What time did Tom leave home? 7:30 am
2. How far did Tom travel from home before stopping? 40 miles
3. How long did Tom stop? 1½ hrs
4. What was the total distance traveled by Tom? 80 mi
5. What was Tom's speed at 8:30am? $\frac{40}{1} = 40 \frac{mi}{hr}$

Ch. 20 p. 558-570 Simple Machines

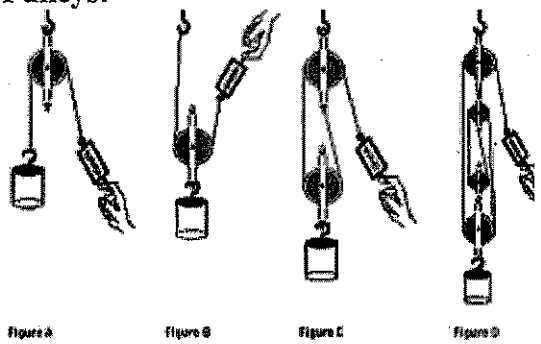
1. Work is done when a force causes an object to move in the direction of the force.
2. To calculate work, you use the formula $W = f \times d$.
3. If you use 100 N of force to lift a box 2 meters off the ground, how much work did you do? 200 J
4. If you push a wagon with 200 N of force for 6 meters, how much work did you do? 1,200 J
5. If you hold a 20N baby 1 meter off of the ground for 10 minutes, how much work did you do? 0 J
6. A Machine is a device that makes work easier by changing the size or direction of a force.
7. Mechanical Adv. is the number of times a machine multiplies your force.
8. The formula for MA is $\frac{\text{O force}}{\text{I force}}$
9. If you pushed a 500 N weight up a ramp with 50 N of force, what is the MA of the ramp? 10
10. The comparison of a machine's work output with work input is the Mech. Efficiency
11. The formula for ME is $\frac{\text{work out}}{\text{work in}} \times 100$
12. If I put 100J of work into a machine and it puts out 50J of work, what is the ME of the machine? 50%
13. If I put 50 J of work into a screwdriver and it puts out 30J of work on the screw, what is the ME? 60%
14. An Ideal machine would have a 100% Mechanical Efficiency.

Levers:



1. What is the MA of a 1st Class lever? 1, <1, or >1
2. What is the MA of a 2nd Class lever? >1
3. What is the MA of a 3rd Class lever? <1
4. Which lever multiplies distance? 3rd class
5. Which lever ALWAYS multiplies force? 2nd Class
6. Which lever can have an MA of 1, <1, and >1? 1st Class

Pulleys:

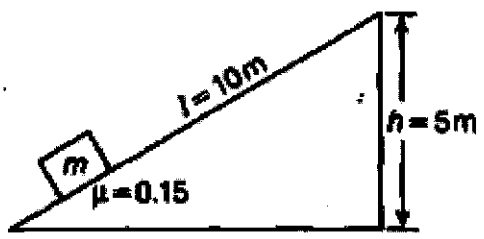


1. Which pulley is fixed? A What is the MA? 1
2. Which pulley is moveable? B What is the MA? 2
3. What is the MA of pulley C? 2
4. What is the MA of pulley D? 4
5. What type of pulleys are C and D? Block + Tackle

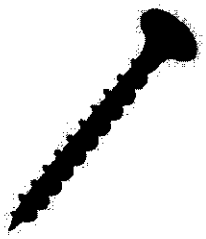
Wheel and Axle:

1. What is the MA if the wheel has a radius of 20cm and the axle has a radius of 10cm? 2
2. What is the MA if the wheel has a radius of 10cm and the axle has a radius of 5cm? 2

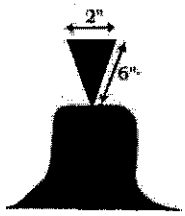
Inclined Planes: These include the ramp, wedge, and the screw.



MA = 2



MA = ≈ 11



MA = 3